Sweet Lupin Production and Marketing

FarmFacts

Produced by Saskatchewan Agriculture and Food and Saskatchewan Rural Development

Sweet White Lupin (Lupinus spp.) is a high protein grain legume which is grown in southeastern United States as a winter forage and green manure. In Australia, it is used as a protein supplement in animal rations.

Some preliminary studies of lupins for Western Canada were conducted by Morden Research Station, the University of Manitoba, and Manitoba, Saskatchewan and Alberta Departments of Agriculture. Most of the information here comes from Joe Tsukamoto's work at Brandon, Manitoba.

Preliminary studies indicate that lupins appear to withstand moisture stress and some frost. Lupins require well-drained soil. However, high free calcium (as indicated by high pH) in the soil is detrimental to plant growth and development. Lupins grown under high free calcium conditions become chlorotic (yellow) and then nectrotic, losing leaves and aborting flowers and resulting the death of the plants. Severity depends on the degree of excessive calcium, the variety of lupin, (eg. *Lupinus angustifolius* is more susceptible than *L. Albus*) and moisture conditions. Under drier conditions, such symptoms may be exaggerated.

In Saskatchewan, all soils except acidic soils are high in calcium and therefore, are likely unsuitable for lupin production.

A further disadvantage in lupin production under Saskatchewan conditions is that there is no commercial variety available that is early enough to mature dependably. Pods containing immature seeds freeze severely when an early frost occurs. Drying frozen seed is very difficult. Some may even mold. For this reason we need an earlier maturing variety than the marketplace offers if we want to produce lupins in Saskatchewan and the other prairie provinces. Work continues at the Crop Development Centre, University of Saskatchewan and elsewhere.

Background Information on Agronomy and Research

In 1984, Manitoba Agriculture imported seed of Uniharvest and Uniwhite lupins from Australia for production in Manitoba. Both varieties and *L. angusifolius* (Blue lupin) also called narrow leaf lupin since their leaves are narrow; whereas *L. albus* (white lupin) has wide leaves.

Both varieties were grown in 1974 and 1975 on low free calcium soil. One field was on sandy soil; the other was on clay loam soil but with shale parental material. They were seeded in the first week of May. Plants grew well but did not flower until too late to produce pods of any size. They appear to be sensitive to day length. It also was noted that *L. angustifolius* is very susceptible to powdery mildew; whereas *L. albus* is not affected.

The variety Neuland (*L. albus*) appears to produce mature seed in the well enclosed, sheltered fields of Morden Research Station but it does not produce mature seed at the Brandon site (110 days).

While investigating the adaptation of lupins, Manitoba investigated the possible use of herbicides in their production. A composite of white lupin seed was made available by Morden Research Station for herbicides trials. Although herbicides trials were not successful, we obtained some mature white lupin seed. According to Morden Research Station, the seed source is not known.

In 1975, a selection was made for mature lupins with about three flower clusters and for tall plants which may provide a silage type of lupins. From here on the lupins referred to are *L. albus*.

In 1980 and 1981, nutritional trials with mice and rats were conducted by the University of Manitoba. These trials were satisfactory. Seed was continued to be multiplied and in 1984, feeding trials with swine were conducted by Agriculture Canada at Brandon. They were not satisfactory because the level of alkaloid was unsuitable for swine. Another selection then was done immediately, and we now have an adequate supply of lower alkaloid lupin for a swine nutritional trial. Swine feeding trials are underway.

Seeding

Seeding rate and sate of seeding trials were conducted; and it was found that a seeding rate of 120 pounds to 150 pounds per acre (135 to 168 kg/ha) is ideal. The ideal seeding time in Manitoba is the first week of May. Lupins should not be seeded after May 15th if mature seed is needed. Inoculum specifically for lupins must be used.

Lupins do not shatter; pods are located about 18 inches (45 cm) above ground; and direct combining is the ideal method of harvesting. Unlike some other legumes, adequate crop residue remains after combining lupins to avoid wind erosion of the soil. Conventional equipment used to plant and harvest cereal grain is all that is needed for lupin production.

In Saskatchewan, yields obtained with recent varieties are too low to be economical.

Pests

No herbicides are currently registered for use in lupin.

Diseases and insect damage are not major problems in lupin production. We observed a tract of *Pythium spp.* Seedcorn maggots can damage emerging seedlings of lupins. Blister beetles (Caragana and Nattal blister beetle) attack the flowering parts of lupins in early July. In a year of drought, blister beetles move away within several days. For these insects, control measures may be necessary.

Further Research

There is a continuing need for varietal improvement of lupins if they are to be adapted to areas in the Canadian prairies. There is a need for herbicides and insecticides to be registered for use in lupin production.

There is a need to establish a cut-off level for so-called excessive free calcium being detrimental to the production of lupins.

Markets

To date, the major market for lupin is in the animal feed industry (35-40% crude protein). Therefore, value of lupin can be gauged by soymeal/pea prices. Researchers are continuing efforts with lupin and are especially hopeful for specialty human food market interest.

Sources of Information

Further information can be obtained from Manitoba Agriculture, 1129 Queens Avenue, Brandon, Manitoba R7A 1L9 (204) 726-6406 or the Crop Development Centre, University of Saskatchewan, Saskatoon, Saskatchewan, S7N 0W0 (306) 966-4943.

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